

Assignment 8

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1 Task 1

1.1 Question

Training and evaluating a U-Net by your favorite dataset publicly available for Segmantion task.

1.2 Answer:

To train U-NET we take a dataset name dog segmentation datasts from kaggle. Which have only 180 images and 180 labels and total size is 5.23 MB. We train the model for 20 epochs.

Metrics	Value
Epoch	20
Accuracy	0.7113
Loss	0.5419
Validation Accuracy	0.6636
Validation Loss	0.5437
Learning Rate	2.0000e-04

Table 1: Training Metrics at Epoch 20

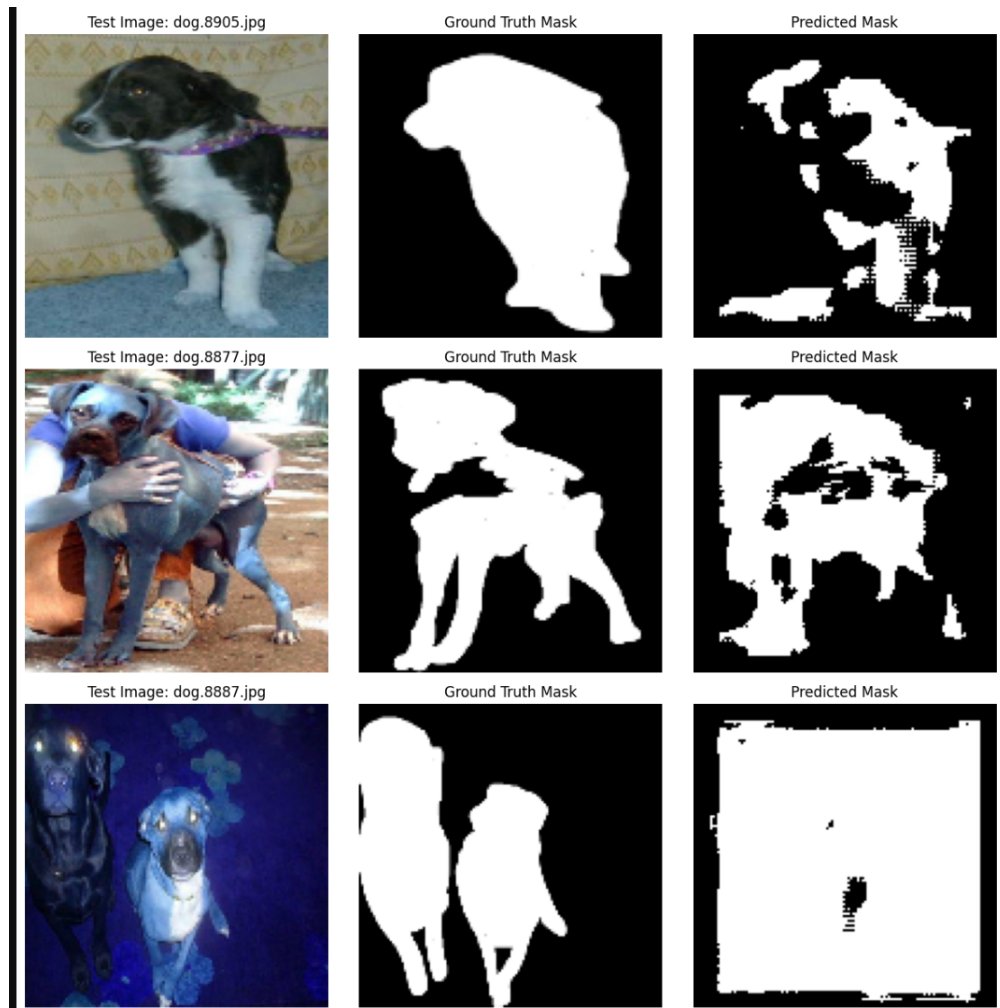


Figure 1: The image shows the Prediction vs Ground Truth value, left original image, middle Ground Truth and right predicted mask.

2 Task 2

2.1 Question

Training and evaluating a U-Net by your favorite dataset publicly available for Crowd Counting task

2.2 Answer:

To train U-NET for crowd counting we use ShanghaiTech Dataset which have 1198 annotated crowd images and also The dataset is divided into two parts, Part-A containing 482 images and Part-B containing 716 images.

Metrics	Value
Epoch	20
Loss	0.0050
Mean Absolute Error (MAE)	0.0056
Validation Loss	0.0032
Validation MAE	0.0065

Table 2: Training and Validation Metrics at Epoch 20

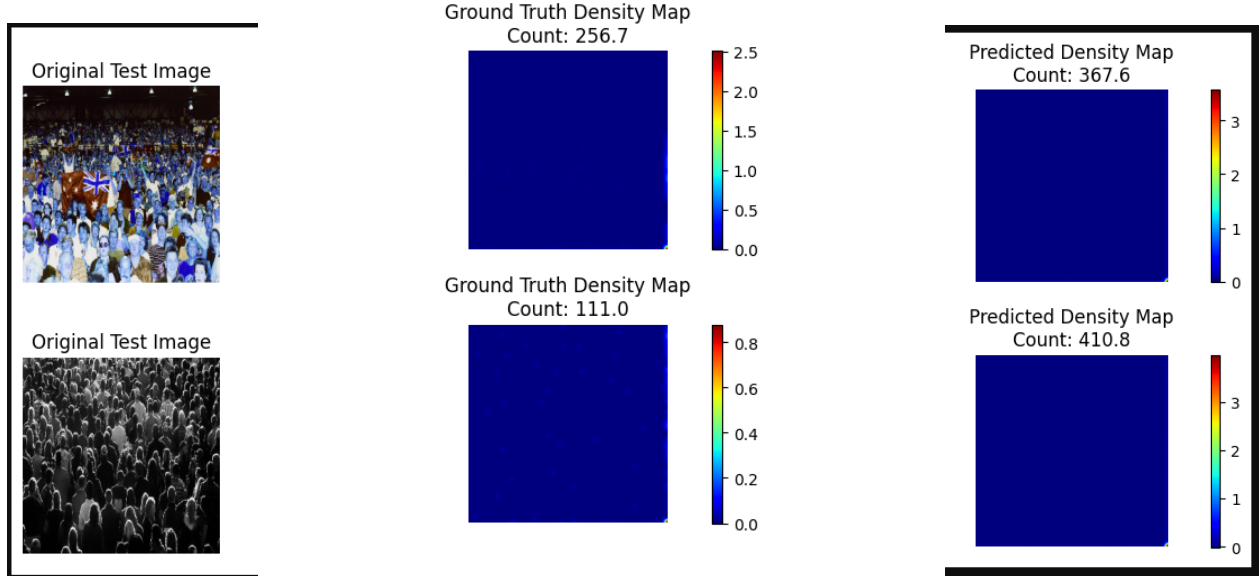


Figure 2: The figure shows the original image on the left side, and ground truth map in the middle, and the predicted map on the right side for crowd counting.

3 Task 3

3.1 Question

Training and evaluating an MCNN by your favorite publicly available dataset for the Crowd Counting task.

3.2 Answer:

To train MCNN, we use the same dataset we used before for the U-NET for crowd counting, we also train it with the same number epoch and the results are shown below in the table.

Metrics	Value
Epoch	20
Loss	0.0060
Validation Loss	0.0028

Table 3: Training and Validation Loss at Epoch 20

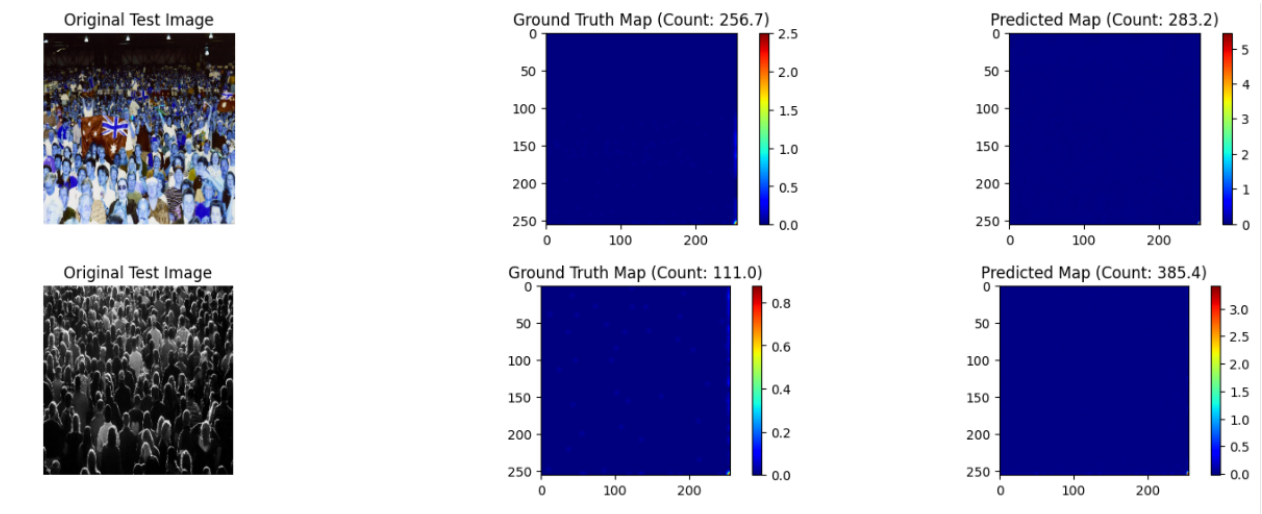


Figure 3: The figure shows the original image on the left side, and ground truth map in the middle, and the predicted map on the right side for crowd counting.

4 Task 4

Comparing MCNN-based and U-Net-based crowd counters.

4.1 Answer:

As we train both models with the same dataset and also calculate validation using by same validation set, we can see the comparison in a table. The table is below, also the validation and training loss curves are shown below.

Metrics	U-Net	MCNN
Epoch	20	20
Loss	0.0050	0.0060
Validation Loss	0.0032	0.0028

Table 4: Comparison of U-Net and MCNN at Epoch 20

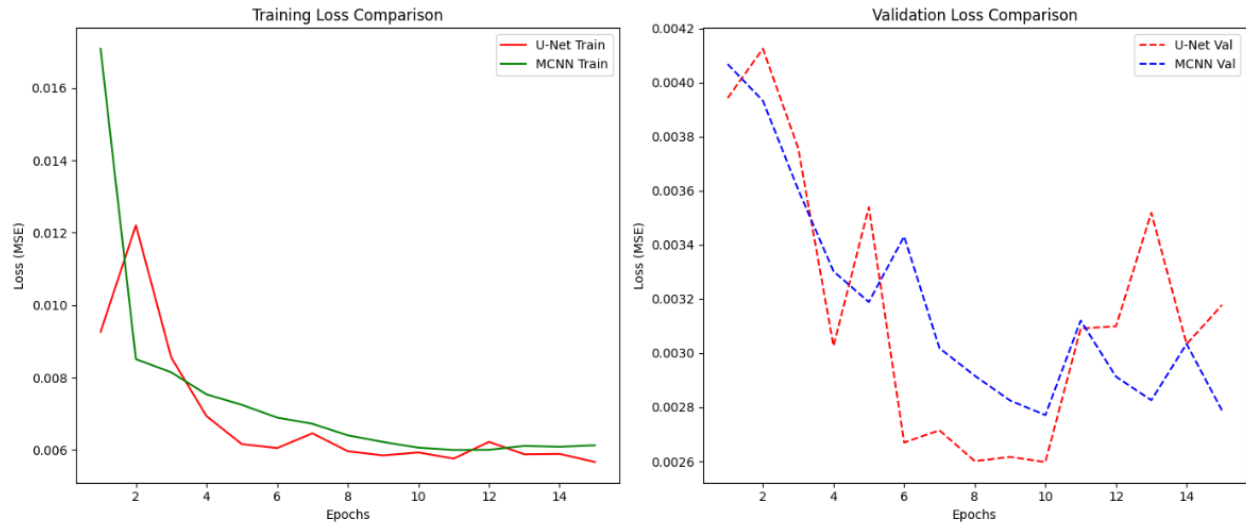


Figure 4: The figure shows the training and validation loss of both models.

5 Code Link

GitHub Link